

REMARKS

In the office action, the examiner notified the applicants that the reissue inventor declaration is defective because it fails to identify at least one error that is relied upon to support the reissue application. The applicants submit herewith a revised declaration that addresses the omission.

Claim Objections

A revised listing of the reissue claims is provided herewith with all claims not in the original patent underlined. A second listing of the claims is provided with amendments made herein shown with strike-through and underline, and with the *new* claims in the first listing no longer underlined and shown with status identifier *previously presented*. This second listing presents the claims that will be currently pending upon filing this response. The applicants regret the confusion and hope that between the two listings the objection is overcome and requirements for claim amendments made herein are also met.

The examiner also objected to the new claims (the ones added in the reissue application that were not in the original patent, i.e., claims 21-40) on the basis that insufficient explanation is given of support in the patent for new claim wording. Of the new claims, the independent claims are claims 21, 28, 35 and 38. Claim 21 is a rewriting of (original) claim 1 containing all of the limitations in claim 1 inter-related in the same way but written such that the active steps of the method now are all steps that must be performed in the country where the prospect is located. Claim 35 bears the same relationship to claim 8, an original claim. In claims 21 and 35, the only wording that the applicants believe can possibly raise a new matter issue is the phrase "that resembles a seismic record from an impulsive force." This phrase explaining a feature known in the art finds full support at column 1, lines 43-44 of the published patent (US 6,477,113). Claim 28 is a rewriting of claim 1 with the same limitations but written such that the active steps of the method read on activity in the country where the data are processed. Claim 38 bears the same relationship to claim 8. The

applicants believe that claim 28 is fully supported by claim 1 and claim 38 is fully supported by claim 8.

Dependent claims 22-27 are the same as original dependent claims 2-7 except for different claim dependency numbers. The same is true of dependent claims 29-34. Dependent claims 36-37 and 39-40 are the same as original dependent claims 9-10 except for claim dependency numbers.

Claim Rejections – 35 U.S.C. § 101

The examiner rejects claims 11-20 drawn to an electrical (current) signal, asserting that this is non-statutory subject matter. The applicants respectfully disagree, believing that the subject matter is a *manufacture*, an opinion presumably shared by the examiner for the original patent (US 6,477,113). The standard patent law treatise, *Chisum on Patents*, adopts the position that “manufacture” is “a comprehensive class of inventions that [includes] every article devised by man except machinery upon the one side and compositions of matter and designs upon the other. Thus it is the residual class of ‘product’ patent – encompassing all man-made items not found in substantially the same form in nature that are neither machines nor compositions of matter.” [§ 1.02[3]] *Chisum* concludes that this expansive view of *manufacture* can be considered the accepted view of U.S. courts except for the 1931 Supreme Court decision in *American Fruit Growers, Inc. vs. Brogdex Co.*, 283 U.S. 1, which decision he evaluates unfavorably (“the reasoning in the Court’s opinion is very weak.”). *Chisum* continues, “It must be concluded that the *American Fruit Growers* treatment of the meaning of ‘manufacture’ is of little or no precedential value.” A copy of section 1.02[3][a] from *Chisum* is attached for its case citations and discussion of key cases.

The electrical signal of claim 11 is significantly man-made. The electrons comprising any flow of current of course exist in nature, but the particular signal described in claim 11 could never be found in nature. This electrical signal is tangible, physical, readily detectable and measurable, and is not a carrier of information such as a radio signal. This electrical signal produces a useful, concrete and tangible result: a seismic response from which structure of the subsurface may be

interpreted. The electrical signal of claims 11-20 is therefore a “manufacture” for purposes of 35 U.S.C. §101.

The examiner gives all remaining claims a different §101 rejection, what might be called the “mental steps” category, evidently believing that the standard for this type of rejection has also changed since year 2002 when US 6,477,113 was allowed. In arriving at this conclusion, the examiner focuses solely on the last step of each independent method claim, concluding in each case that the last step is “an abstract idea that could be performed by a person in their head,” and that “the final step does not produce a real world result or result in a physical transformation.” The appellants disagree.

The examiner’s position appears to revolve partly around the meaning of *correlate*. The examiner interprets this as an abstract idea that could be performed by a person in their head. Instead of this dictionary-based, lay-minded approach to claim interpretation, a person of ordinary skill in the seismic arts would know, even without reading the specification of the present application, that correlating one waveform (in this case, the measured signal) with a reference waveform is a term of art. The applicants attach an excerpt from a standard treatise, *Seismic Data Processing* by Yilmaz, explaining the correlation operation. Quoting from page 18 of that reference:

“Seismic processing often requires measurement of the similarity or time alignment of two traces. *Correlation* is another time-domain operation that is used to make such measurements.”

(A trace is what is measured by a seismic receiver as a function of time.) The Yilmaz reference, also given in the application in the discussion of Figs. 1A-D (column 3, lines 41-53 in the original patent), explains how the correlation operation is performed.

It seems apparent from the examiner’s choice of words that the mental step rejections are based at least in part on the recent decision in *Lab. Corp. of Am. Holdings vs. Metabolite Labs., Inc.*, 370 F.3d 1354 (Fed. Cir. 2004), cert dismissed (2006). That decision concerned the following claim:

13. A method for detecting a deficiency of cobalamin or folate in warmblooded animals comprising the steps of:

assaying a body fluid for an elevated level of total homocysteine; and

correlating an elevated level of total homocysteine in said body fluid with a deficiency of cobalamin or folate.

An issue raised only in the Supreme Court brief (never raised in the courts below), but never decided when cert. was dismissed, was whether the *correlating* step pre-empted thought. The claimed invention was simply to measure the level of homocysteine in a subject, and if the level was elevated above normal, to identify a vitamin B-12 or folic acid deficiency as a possible cause. The pre-empting thought theory was that if a physician happened to run the homocysteine test for whatever reason, the claim would prevent him from thinking about the result. Whatever the merits of that theory under the *Lab. Corp* facts, the “correlating” step in the present claims is not a pre-emption of thought about anything (about what?).

Next, the applicants respond to the other aspect of the “mental steps” rejections, the examiner argument that the final step in the application’s independent method claims does not produce a real world result or result in a physical transformation. That response is simple. The claims are drawn to “a method for electroseismic prospecting of a subterranean formation” (claim preamble). The ordinary artisan in the field of seismic data processing fully appreciates what is stated for example at column 1, lines 43-44 of the original patent (US 6,477,113), namely that correlating the recorded seismic data with a reference (such as the sweep wavetrain, using vibrator applications as an example) produces a data record that resembles a conventional seismic record with a clearly defined zero reference time such as that which results from an impulsive (explosive) source. At that point, the ordinary artisan knows to process and interpret the data the same as for conventional seismic exploration, with the correlation side lobes that tend to obscure the desired data greatly reduced by the present inventive method. The “real world result” of this

is that the user of the invention is able to interpret subsurface structure including the existence of formations likely to contain oil or gas, which is the same real world result as in the case of any seismic survey of an area. It has been established for many years that seismic techniques are patentable subject matter. Another real world result is that the electrical signal of the present invention, when transmitted into a subterranean formation, produces a physical change in the subterranean formation, as evidenced by the seismic wave emitted in response.

The arguments of the preceding paragraph apply to all of the independent method claims, including those claims in which the last step calls for summing a pair of correlated records. In certain embodiments of the invention, two particularly designed source waveforms are separately transmitted into the ground as part of the side-lobe elimination strategy. The two resulting correlated records are then summed to cancel side lobes. The result again is a data record, significantly free of side lobes, that is ready for further processing and interpretation by the same techniques used in conventional seismic exploration.

Claim Rejections – 35 U.S.C. § 112

The applicants herewith amend claims 21 and 35 in response to the examiner's indefiniteness rejections:

21. *(currently amended)* A method for electroseismic prospecting of a subterranean formation, said method comprising:

(a) obtaining a source waveform selected to reduce amplitudes of side lobes produced by correlation with a selected reference waveform;

(ba) generating thea selected source waveform as an electrical signal and transmitting it into the subterranean formation; ~~said source waveform and a corresponding reference waveform having been selected to reduce amplitudes of side lobes produced by~~

~~correlation of the source waveform with the reference waveform; and~~

- (c**b**) detecting and recording seismic signals resulting from conversion of the electrical signal to seismic energy in the subterranean formation, ~~wherein in order to correlate said seismic signals with the reference waveform to produce a correlated record that resembles a seismic record from an impulsive force when correlated with the reference waveform.~~

35. *(currently amended)* A method for electroseismic prospecting of a subterranean formation, said method comprising:

- (a) ~~obtaining~~generating each of two source waveforms as an electrical signal, and transmitting each said electrical signal, in turn, into the subterranean formation, said source waveform being constructed by repeating a single element, said element consisting of a single full cycle of a periodic waveform, said periodic waveform having a frequency determined to give desired depth penetration of the subterranean formation, said elements being pieced together with polarities specified sequentially by one member of a Golay complementary pair of binary sequences in the case of one source waveform, and by the second member of the Golay complementary pair in the case of the other source waveform; and
- (b) generating each of the two source waveforms as an electrical signal and transmitting each said electrical signal, in turn, into the subterranean formation; and
- (c**b**) detecting and recording seismic signals ~~resulting~~resulting from conversion of each of the two electrical signals to seismic energy in the subterranean formation, wherein a record that resembles a seismic record from an impulsive force can be produced by in order to correlating said seismic signals with

the source waveform used to generate them and then to
summing the correlated record due to one source waveform
with the correlated record due to the other source waveform;
~~thereby producing a correlated record that resembles a seismic
record from an impulsive force.~~

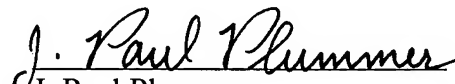
CONCLUSION

The applicants believe that these changes eliminate any question of indefiniteness in the two claims. The applicants believe that the changes are clarification only and introduce no new matter.

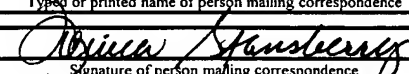
The applicants believe that all objections and rejections have been dealt with by amendment or argument, and therefore all resulting claims are in condition either for allowance or examination against prior art if that has been deferred. If the examiner wishes to discuss this application with counsel, please contact the undersigned.

Respectfully submitted,

Date: November 14, 2006


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